IS 6418 (1971): Cast iron and malleable cast iron flanges for general engineering purposes [MTD 6: Pig iron and Cast Iron]

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IS : 6418 - 1971
(Reaffirmed 2000)

Indian Standard

SPECIFICATION FOR CAST IRON AND MALLEABLE CAST IRON FLANGES FOR GENERAL ENGINEERING PURPOSES

Eighth Reprint AUGUST 2004

(Incorporating Amendment No. 1)

UDC 621.643.412:669.13

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 4 *May* 1972

Indian Standard

SPECIFICATION FOR CAST IRON AND MALLEABLE CAST IRON FLANGES FOR GENERAL ENGINEERING PURPOSES

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Indian Standard

SPECIFICATION FOR CAST IRON AND MALLEABLE CAST IRON FLANGES FOR GENERAL ENGINEERING PURPOSES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 10 November 1971, after the draft finalized by the Cast Iron and Malleable Cast Iron Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 The ISO Technical Committee 5 Pipes and Fittings set up subcommittees to deal with the pipes and flanges and recommendations made by the subcommittees have been published. Since the publication of the ISO Recommendations, the overseas standards organizations have been revising their flange standards to bring the flange pipe connecting dimensions in accordance with these recommendations. BS 4504 : 1969 'Flanges and bolting for pipes, valves and fittings — metric series', which has now superseded BS 10 : 1962 'Flanges and bolting for pipes, valves and fittings' has been prepared on the basis of the discussion at the meeting of the ISO Subcommittee concerned with the standards on flanged dimensions. The Indian Standard specification is primarily based on BS 4504 : 1969. Assistance has also been derived from DIN 2532 : 1967 'Flanges nominal pressure 10' issued by Deutscher Normenausschuss (DNA), West Germany.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard covers cast iron and malleable cast iron flanges for general engineering purposes. The flanges shall be applicable from 0° to 300°C for oil, water, steam, compressed air, gases and other non-corrosive fluids.

*Rules for rounding off numerical values (*revised*).

1.2 The type of gasket and gasket materials are not covered in the standard and shall be subject to agreement between the manufacturer and the purchaser.

2. PRESSURE AND TEMPERATURE RATING

2.1 The cast iron and malleable cast iron flanges covered by this specification shall have the temperature and pressure ratings as specified in Table 1.

2.1.1 The pressure rating for grey cast iron flanges, when used in pipe lines containing water, are for non-shock conditions. Where moderate shock (such as may occur in efficiently designed and operated boiler feed main) is likely to be present, the pressure and temperature rating shall be reduced by 25 percent.

3. DESIGNATION

3.1 The flanges shall be designated by the nominal size and flange table reference.

3.1.1 The first part of the table reference is the nominal pressure. The second part of the table reference indicates the material and type of flange as follows:

a) Grey cast iron — integral
b) Malleable cast iron — integral
c) Malleable cast iron — screwed boss

For example, Table 0·25/1 stands for grey cast iron — integral flanges with a nominal pressure of 0·25 N/mm^2.

4. SUPPLY OF MATERIAL

4.1 General requirements relating to the supply of the material shall be in accordance with IS : 1387-1967*.

5. MATERIAL

5.1 **Flanges** — The material shall conform to any of the following requirements:

Grey cast iron	Grade 15 or 20 of IS : 210-1970†
Malleable cast iron:	
a) Whiteheart	Grade B of IS : 2107-1962‡
b) Blackheart	Grade C of IS : 2108-1962§

The type of flanges are shown in Fig. 1 and 2.

*General requirements for the supply of metallurgical materials (*first revision*).
†Specification for grey iron castings (*second revision*).
‡Specification for whiteheart malleable iron castings.
§Specification for blackheart malleable iron castings.

5.2 Bolting — The materials shall conform to Class 4·6 or 6·6 of IS : 1367-1967* for both bolts and nuts. Threads on bolts, studs and nuts shall be of the coarse series for sizes M 27 and fine for sizes M 27 and over.

6. DIMENSIONS

6.1 Flange dimensions shall be as specified in Tables 2 to 12, read with Fig. 1 and 2 whichever is applicable.

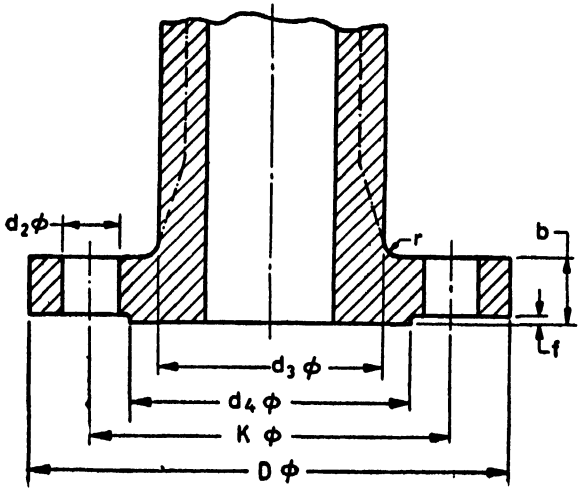

FIG. 1 INTEGRAL FLANGE

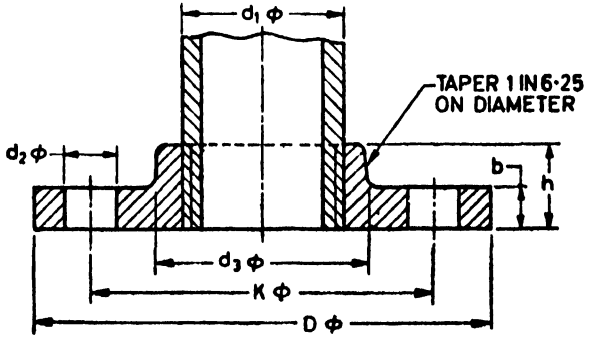

FIG. 2 SCREWED BOSS FLANGE

*Technical supply conditions for threaded fasteners (*first revision*).

TABLE 1 PRESSURE/TEMPERATURE RATINGS FOR GREY AND MALLEABLE CAST IRON FLANGES

(*Clause* 2.1)

Nominal Pressure N/mm²	Type of Material		Design Pressure (N/mm²) at Temperature, °C							
	Cast Iron	Malleable Cast Iron	−10 to 120	150	180	200	220	250	260	300
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·25	IS: 210 Gr 15	—	0·25	—	—	—	—	—	—	—
	IS: 210 Gr 20	—	0·25	0·23	0·20	0·20	0·20	0·18	0·17	0·15
0·60	IS: 210 Gr 15	—	0·60	—	—	—	—	—	—	—
	IS: 210 Gr 20	—	0·60	0·56	0·52	0·50	0·50	0·45	0·43	0·36
	—	IS : 2107 Gr B	0·60	0·58	0·56	0·55	0·55	0·50	0·50	0·50
	—	IS : 2108 Gr C	0·60	0·58	0·56	0·55	0·55	0·50	0·50	0·50
1·0	IS : 210 Gr 15	—	1·00	—	—	—	—	—	—	—
	IS : 210 Gr 20	—	1·00	0·92	0·85	0·80	0·80	0·70	0·68	0·60
1·6	IS : 210 Gr 20	—	1·60	1·48	1·39	1·30	1·30	1·10	1·08	1·00
	—	IS : 2107 Gr B	1·60	1·56	1·52	1·50	1·40	1·40	1·38	1·30
	—	IS : 2108 Gr C	1·60	1·56	1·52	1·50	1·40	1·40	1·38	1·30
2·5	IS : 210 Gr 25	—	2·50	2·30	2·12	2·00	1·80	1·80	1·75	1·60
	—	IS : 2107 Gr B	2·50	2·42	2·35	2·30	2·20	2·10	2·08	2·00
	—	IS : 2108 Gr C	2·50	2·42	2·35	2·30	2·20	2·10	2·08	2·00

NOTE 1 — 1 N/mm² = 0·102 kg/mm².

NOTE 2 — Intermediate values may be obtained by linear interpolation.

TABLE 2 0·25/1 INTEGRAL GREY CAST IRON FLANGES (*see* Fig. 1)

(*Clause* 6.1)

Nominal pressure 0·25 N/mm².

All dimensions in millimetres.

NOTE — For nominal sizes 10 to 1 000, use Table 3.

NOMINAL SIZE	FLANGE		RAISED FACE		BOLTING	DRILLING			NECK	
	D	*b*	d_4	*f Max*		No.	d_2	*k*	d_3	*r*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1 200	1 375	30	1 280	5	M27	32	30	1 320	1 250	8
1 400	1 575	30	1 480	5	M27	36	30	1 520	1 452	8
1 600	1 790	32	1 690	5	M27	40	30	1 730	1 654	10
1 800	1 990	34	1 890	5	M27	44	30	1 930	1 856	10
2 000	2 190	34	2 090	5	M27	48	30	2 130	2 056	10
2 200	2 405	36	2 295	6	M30	52	33	2 340	2 260	10
2 400	2 605	38	2 495	6	M30	56	33	2 540	2 464	10
2 600	2 805	40	2 695	6	M30	60	33	2 740	2 668	10
2 800	3 030	42	2 910	6	M33	64	36	2 960	2 868	12
3 000	3 230	42	3 110	6	M33	68	36	3 160	3 068	12
3 200	3 430	44	3 310	6	M33	72	36	3 360	3 268	12
3 400	3 630	46	3 510	6	M33	76	36	3 560	3 472	12
3 600	3 840	48	3 720	6	M33	80	36	3 770	3 676	12
3 800	4 045	48	3 920	6	M36	80	39	3 970	3 876	12
4 000	4 245	50	4 120	6	M36	84	39	4 170	4 076	12

TABLE 3 0·6/1 INTEGRAL GREY CAST IRON FLANGES (*see* Fig. 1)

(*Clause* 6.1)

Nominal pressure 0·6 N/mm².

All dimensions in millimetres.

NOTE — Use this table also for nominal sizes 10 to 1 000 and nominal pressure 0·25 N/mm².

NOMINAL SIZE	FLANGE		RAISED FACE		BOLTING	DRILLING			NECK	
	D	*b*	d_4	*f Max*		No.	d_3	*k*	d_2	*r*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
10	75	12	35	2	M10	4	11	50	26	3
15	80	12	40	2	M10	4	11	55	31	3
20	90	14	50	2	M10	4	11	65	38	4
25	100	14	60	2	M10	4	11	75	47	4
32	120	16	70	2	M12	4	14	90	56	4
40	130	16	80	3	M12	4	14	100	64	4
50	140	16	90	3	M12	4	14	110	74	4
65	160	16	110	3	M12	4	14	130	89	4
80	190	18	128	3	M16	4	18	150	108	5
100	210	18	148	3	M16	4	18	170	128	5
125	240	20	178	3	M16	8	18	200	155	5
150	265	20	202	3	M16	8	18	225	180	5
200	320	22	258	3	M16	8	18	280	234	6
250	375	24	312	3	M16	12	18	335	286	6
300	440	24	365	4	M20	12	22	395	336	6

350	490	26	415	4	M20	12	22	445	390	8
400	540	28	465	4	M20	16	22	495	442	8
500	645	30	570	4	M20	20	22	600	546	8
600	755	30	670	5	M24	20	26	705	646	8
700	860	32	775	5	M24	24	26	810	748	10
800	975	34	880	5	M27	24	30	920	852	10
900	1 075	36	980	5	M27	24	30	1 020	954	10
1 000	1 175	36	1 080	5	M27	28	30	1 120	1 054	10
1 200	1 405	40	1 295	5	M30	32	33	1 340	1 260	10
1 400	1 630	44	1 510	5	M33	36	36	1 560	1 466	12
1 600	1 830	48	1 710	5	M33	40	36	1 760	1 672	12
1 800	2 045	50	1 920	5	M36	44	39	1 970	1 876	15
2 000	2 265	54	2 125	5	M39	48	42	2 180	2 082	15
2 200	2 475	60	2 335	6	M39	52	42	2 390	2 290	15
2 400	2 685	62	2 545	6	M39	56	42	2 600	2 494	18
2 600	2 905	64	2 750	6	M45	60	48	2 810	2 696	18
2 800	3 115	68	2 960	6	M45	64	48	3 020	2 902	18
3 000	3 315	70	3 160	6	M45	68	48	3 220	3 106	18
3 200	3 525	76	3 370	6	M45	72	48	3 430	3 314	18
3 400	3 735	80	3 580	6	M45	76	48	3 640	3 520	20
3 600	3 970	84	3 790	6	M52	80	56	3 860	3 726	20

IS : 6418 - 1971

TABLE 4 0·6/2 MALLEABLE CAST IRON INTEGRAL FLANGES (*see* Fig. 1)

(*Clause* 6.1)

Nominal pressure 0·6 N/mm².

All dimensions in millimetres.

Nominal Size	Flange		Raised Face		Bolting	Drilling			Neck	
	D	b	d_4	f		No.	d_2	k	d_3	r
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
10	75	9	35	2	M10	4	11	50	26	3
15	80	10	40	2	M10	4	11	55	31	3
20	90	10	50	2	M10	4	11	65	38	4
25	100	11	60	2	M10	4	11	75	47	4
32	120	11	70	2	M12	4	14	90	56	4
40	130	12	80	3	M12	4	14	100	64	4
50	140	12	90	3	M12	4	14	110	74	4
65	160	13	110	3	M12	4	14	130	89	4
80	190	13	128	3	M16	4	18	150	108	5
100	210	15	148	3	M16	4	18	170	128	5
125	240	17	178	3	M16	8	18	200	155	5
150	265	17	202	3	M16	8	18	225	180	5

TABLE 5 0·6/3 MALLEABLE CAST IRON SCREWED BOSS FLANGES (*see* Fig. 2)

(*Clause* 6.1)

Nominal pressure 0·6 N/mm².

All dimensions in millimetres.

Nominal Size	Pipe O.D. d_1 ≈	Flange d	Flange b	Flange h	Bolting	Drilling No.	Drilling d_2	Drilling k	Boss d_3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
6	10·2	65	8	15	M10	4	11	40	18
8	13·5	70	8	15	M10	4	11	45	22
10	17·2	75	9	17	M10	4	11	50	26
15	21·3	80	10	17	M10	4	11	55	32
20	26·9	90	10	19	M10	4	11	65	38
25	33·7	100	11	20	M10	4	11	75	46
32	42·4	120	11	22	M12	4	14	90	56
40	48·3	130	12	22	M12	4	14	100	63
50	60·3	140	12	26	M12	4	14	110	77
65	76·1	160	13	31	M12	4	14	130	92
80	88·9	180	13	34	M16	4	18	150	106
100	114·3	210	15	40	M16	4	18	170	132
125	139·7	240	17	44	M16	8	18	200	160
150	265·1	165	17	44	M16	8	18	225	185

TABLE 6 1·0/1 INTEGRAL GREY CAST IRON FLANGES (*see* Fig. 1)

(*Clause* 6.1)

Nominal pressure 1·0 N/mm².

All dimensions in millimetres.

NOTE — For nominal sizes 10 to 175, use Table 7.

Nominal Size	Flange D	Flange b	Raised Face d_4	Raised Face f Max	Bolting	Drilling No.	Drilling d_2	Drilling k	Neck d_5	Neck r
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
200	340	26	268	3	M20	8	22	295	240	8
250	395	28	320	3	M20	12	22	350	292	8
300	445	28	370	4	M20	12	22	400	342	8
350	505	30	430	4	M20	16	22	460	396	8
400	565	32	482	4	M24	16	26	515	448	10
450	615	32	532	4	M24	20	26	565	498	10
500	670	34	585	4	M24	20	26	620	552	10
600	780	36	685	5	M27	20	30	725	654	10
700	895	40	800	5	M27	24	30	840	760	10
800	1 015	44	905	5	M30	24	33	950	866	12
900	1 115	46	1 005	5	M30	28	33	1 050	970	12
1 000	1 230	50	1 110	5	M33	28	36	1 160	1 076	12
1 200	1 455	56	1 330	5	M36	32	39	1 380	1 284	15
1 400	1 675	62	1 535	5	M39	36	42	1 590	1 494	18
1 600	1 915	68	1 760	5	M45	40	48	1 820	1 702	18
1 800	2 115	70	1 960	5	M45	44	48	2 020	1 906	18
2 000	2 325	74	2 170	5	M45	48	48	2 230	2 112	18
2 200	2 550	80	2 370	6	M52	52	56	2 440	2 320	20
2 400	2 760	82	2 570	6	M52	56	56	2 650	2 524	20
2 600	2 960	88	2 780	6	M52	60	56	2 850	2 732	20
2 800	3 180	94	3 000	6	M52	64	56	3 070	2 940	20
3 000	3 405	100	3 210	6	M56	68	62	3 290	3 150	20

TABLE 7 1·6/1 INTEGRAL GREY CAST IRON FLANGES (*see* Fig. 1)

(*Clause* 6.1)

Nominal pressure 1·6 N/mm².

All dimensions in millimetres.

Nominal Size	Flange		Raised Face		Bolting	Drilling			Neck	
	D	b	d_4	f		No.	d_3	k	d_5	r
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
10	90	14	40	2	M12	4	14	60	30	4
15	95	14	45	2	M12	4	14	65	37	4
20	105	16	58	2	M12	4	14	75	42	4
25	115	16	68	2	M12	4	14	85	49	4
32	140	18	78	2	M16	4	18	100	60	5
40	150	18	88	3	M16	4	18	110	68	5
50	165	20	102	3	M16	4	18	125	80	5
65	185	20	122	3	M16	4	18	145	95	5
80	200	22	138	3	M16	8	18	160	114	6
100	220	24	158	3	M16	8	18	180	136	6
125	250	26	188	3	M16	8	18	210	165	8
150	285	26	212	3	M20	8	22	240	190	8
175	315	28	242	3	M20	8	22	270	217	8
200	340	30	268	3	M20	12	22	295	246	8
250	405	32	320	3	M24	12	26	355	298	10
300	460	32	378	4	M24	12	26	410	348	10
350	520	36	438	4	M24	16	26	470	404	10
400	580	38	490	4	M27	16	30	525	458	10
450	640	40	550	4	M27	20	30	585	510	10
500	715	42	610	4	M30	20	33	650	564	12
600	840	48	725	5	M33	20	36	770	672	12
700	910	54	795	5	M33	24	36	840	764	12
800	1 025	58	900	5	M36	24	39	950	870	12
900	1 125	62	1 000	5	M36	28	39	1 050	976	12
1 000	1 255	66	1 115	5	M39	28	42	1 170	1 082	12

TABLE 8 1·6/2 MALLEABLE CAST IRON INTEGRAL FLANGES (*see* Fig. 1)

(*Clause* 6.1)

Nominal pressure 1·0 and 1·6 N/mm².

All dimensions in millimetres.

Nominal Size	Flange		Raised Face		Bolting	Drilling			Neck	
	D	b	d_4	f		No.	d_3	k	d_5	r
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
10	90	14	40	2	M12	4	14	60	30	4
15	95	14	45	2	M12	4	14	65	37	4
20	105	16	58	2	M12	4	14	75	42	4
25	115	16	68	2	M12	4	14	85	49	4
32	140	16	78	2	M16	4	18	100	60	5
40	150	16	88	3	M16	4	18	110	68	5
50	165	18	102	3	M16	4	18	125	80	5
65	185	18	122	3	M16	4	18	145	95	5
80	200	20	138	3	M16	8	18	160	114	6
100	220	20	158	3	M16	8	18	180	136	6
125	250	22	188	3	M16	8	18	210	165	8
150	285	22	212	3	M20	8	22	240	190	8

TABLE 9 1·6/3 MALLEABLE CAST IRON SCREWED BOSS FLANGES (*see* Fig. 2)

(*Clause* 6.1)

Nominal pressure 1·0 and 1·6 N/mm².

All dimensions in millimetres.

Nominal Size	Pipe O.D. d_1 ≈	Flange			Bolting	Drilling			Boss d_6
		D	b	h		No.	d_3	k	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
6	10·2	75	12	18	M10	4	11	50	20
8	13·5	80	12	18	M10	4	11	55	25
10	17·2	90	14	20	M12	4	14	60	30
15	21·3	95	14	20	M12	4	14	65	35
20	26·9	105	16	24	M12	4	14	75	45
25	33·7	115	16	24	M12	4	14	85	52
32	42·4	140	16	26	M16	4	18	100	60
40	48·3	150	16	26	M16	4	18	110	70
50	60·3	165	18	28	M16	4	18	125	85
65	76·1	185	18	32	M16	4	18	145	105
80	88·9	200	20	34	M16	8	18	160	118
100	114·3	220	20	40	M16	8	18	180	140
125	139·7	250	22	44	M16	8	18	210	168
150	165·1	285	22	44	M20	8	22	240	195

TABLE 10 2·5/1 INTEGRAL GREY CAST IRON FLANGES (*see* Fig. 1)

(*Clause* 6.1)

Nominal pressure 2·5 N/mm².

All dimensions in millimetres.

Nominal Size	Flange		Raised Face		Bolting	Drilling			Neck	
	D	b	d_4	f Max		No.	d_3	k	d_5	r
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
10	90	16	40	2	M12	4	14	60	30	4
15	95	16	45	2	M12	4	14	65	37	4
20	105	18	58	2	M12	4	14	75	44	5
25	115	18	68	2	M12	4	14	85	53	5
32	140	20	78	2	M16	4	18	100	62	5
40	150	20	88	3	M16	4	18	110	70	5
50	165	22	102	3	M16	4	18	125	84	6
65	185	24	122	3	M16	8	18	145	101	6
80	200	26	138	3	M16	8	18	160	120	6
100	235	28	162	3	M20	8	22	190	142	6
125	270	30	188	3	M24	8	26	220	171	6
150	300	34	218	3	M24	8	26	250	202	8
175	330	32	248	3	M24	12	26	280	223	10
200	360	34	278	3	M24	12	26	310	252	10
250	425	36	335	3	M27	12	30	370	304	10
300	485	40	395	4	M27	16	30	430	360	10
350	555	44	450	4	M30	16	33	490	416	12
400	620	48	505	4	M33	16	36	550	472	12
500	730	52	615	4	M33	20	36	660	578	15

TABLE 11 2·5/2 MALLEABLE CAST IRON INTEGRAL FLANGES (*see* Fig. 1)

(*Clause* 6.1)

Nominal pressure 2·5 N/mm².

All dimensions in millimetres.

Nominal Size	Flange		Raised Face		Bolting	Drilling			Neck	
	D	b	d_4	f		No.	d_2	k	d_3	r
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
10	90	16	40	2	M12	4	14	60	30	4
15	95	16	45	2	M12	4	14	65	37	4
20	105	18	58	2	M12	4	14	75	44	5
25	115	18	68	2	M12	4	14	85	53	5
32	140	18	78	2	M16	4	18	100	62	5
40	150	18	88	3	M16	4	18	110	70	5
50	165	20	102	3	M16	4	18	125	84	6
65	185	22	122	3	M16	8	18	145	101	6
80	200	24	138	3	M16	8	18	160	120	6
100	235	24	162	3	M20	8	22	190	142	6
125	270	26	188	3	M24	8	26	220	171	6
150	300	28	218	3	M24	8	26	250	202	8

TABLE 12 2·5/3 MALLEABLE CAST IRON SCREWED BOSS FLANGES (*see* Fig. 2)

(*Clause* 6.1)

Nominal pressure 2·5 N/mm².

All dimensions in millimetres.

Nominal Size	Pipe O.D.	Flange			Bolting	Drilling			Boss
	d_1 ≈	D	b	h		No.	d_2	k	d_3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
6	10·2	75	14	20	M10	4	11	50	20
8	13·5	80	14	20	M10	4	11	55	25
10	17·2	90	16	22	M12	4	14	60	30
15	21·3	95	16	22	M12	4	14	65	35
20	26·9	105	18	26	M12	4	14	75	45
25	33·7	115	18	28	M12	4	14	85	52
32	42·4	140	18	30	M16	4	18	100	60
40	48·3	150	18	32	M16	4	18	110	70
50	60·3	165	20	34	M16	4	18	125	85
65	76·1	185	22	38	M16	8	18	145	105
80	88·9	200	24	40	M16	8	18	160	118
100	114·3	235	24	44	M20	8	22	190	145
125	139·7	270	26	48	M24	8	26	220	170
150	165·1	300	28	52	M24	8	26	250	200

6.2 Raised Jointing Face — Grey cast iron and malleable cast iron shall have raised joint faces as shown in Fig. 1.

6.2.1 If flat joint faces are required they shall be specified by the purchaser.

6.3 Flange Drilling — All flanges shall be drilled unless otherwise specified by the purchaser. Bolt holes shall be equally spaced on the pitch circle diameter and in the case of integral flanges, the bolt holes shall be drilled off centres.

7. TOLERANCES

7.1 Tolerances on Flange Diameter — The following tolerances shall apply:

Nominal Diameter of Pipe	*Tolerance*
mm	mm
Up to 200	± 1
,, ,, 500	± 2
,, ,, 1200	± 3
Above 1200	± 4

7.2 Tolerances on Thickness of Flange — The thickness at no point shall be less than the specified thickness. Over tolerance may be permitted up to 10 percent of the specified thickness.

8. THREAD OF SCREWED FLANGES

8.1 Flanges up to 600 mm shall be threaded in accordance with IS : 3333 (Part I)-1967*. The flanges of larger size shall be secured by other suitable methods.

9. FLANGE FACING

9.1 The finish of the flange joint face shall be one of the following types:

a) Smooth — with no visible tool marks, or

b) Serrated — with a continuous spiral groove of 1·5 mm pitch and approximately 0·25 mm deep.

10. GENERAL

10.1 The surfaces of the flanges shall be free from casting surface defects and segregations.

10.2 It is recommended to use stud bolts with nuts on both sides for nominal pressures above 15 kgf/cm². The grade of studs, bolts and nuts shall be semi-precision (S) according to IS : 1367-1967†.

*Dimensions for petroleum industry pipe threads: Part I Line pipe threads.
†Technical supply conditions for threaded fasteners (*first revision*).

11. HYDRAULIC TEST

11.1 This standard does not specify hydraulic test pressures for flange pipes or components, details of which shall be obtained from appropriate standards which specify test pressures for pipes or components, but the test pressure applied to the joint shall not exceed 1·5 times the nominal pressure for the flanges.

12. PROTECTIVE COATING

12.1 If required by the purchaser, after inspection, flanges shall be thoroughly cleaned and threaded and machined parts shall be coated with a suitable rust preventive.

13. MARKING

13.1 The flanges shall be marked with the following except that integral flanges need not be marked where the component itself is marked:

a) Designation, and

b) Name or trade-mark of the manufacturer.

13.1.1 The product may also be marked with Standard mark.

13.1.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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Printed at New India Printing Press, Khurja, India